

Fleming observed, "I would venture to suggest that it is only a variety of *Gadus morrhua*."

It agrees with *Gadus macrocephalus*, Tiles. ; but unfortunately that author does not record the number of fin-rays. However, the length of the head, size of the eye, extent of the upper jaw, and the elongated ventral ray are the same. Tilesius's example came from Kamtschatka ; Kner and Steindachner's from Decastris Bay. *Gadus callarias* (Bloch), Griffith in Cuv. Animal Kingdom, x. p. 484, may be this species, which he observes has the upper jaw longer than in *Gadus morrhua* ; but such is not shown in Bloch's figure, which appears to represent the Common Cod.

The "Lord-fish" of Yarrell appears to differ from this specimen in the eye being smaller and the upper jaw shorter ; but it must be remembered that only a coloured figure was kept. The number of rays in the fins of fishes of this genus are subject to considerable variation ; but if Turton's, Yarrell's, Kner and Steindachner's, and the present form are examples of the same species, the latitude must be very wide indeed.

#### PLATE XIV.

*Morrhua macrocephala*, reduced sketch of the specimen obtained at the mouth of the Thames, 1879.

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#### MOLLUSCA OF H.M.S. 'CHALLENGER' EXPEDITION.

IV. TROCHIDÆ continued, viz. the Genera *Basilissa* and *Trochus*, and the TURBINIDÆ, viz. the Genus *Turbo*. By the Rev. R. BOOG WATSON, B.A., F.L.S., &c.

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[Read June 5, 1879.]

THE *Basilissa oxytropis* which follows did not present itself in time to be included in the previous list.

Of the *Trochus* group the Margaritas are many of them remarkable for beauty and for form.

The Turbos are very few ; but one is of extraordinary beauty.

All the species now communicated are new. Some are from very deep water. All throw light on a marine zone not yet familiar. The list of known species presents no such features of interest as to call for its publication at present.

*List of Genera and Species.*

- |   |   |
|---|---|
| 7. <i>Basilissa oxytropis</i> , <i>W.</i>                         | 10. <i>Trochus</i> ( <i>Margarita</i> ) <i>clavatus</i> , <i>W.</i> |
| 1. <i>Trochus</i> ( <i>Gibbula</i> ) <i>glyptus</i> , <i>W.</i>   | 11. <i>T.</i> (—) <i>rhyusus</i> , <i>W.</i>                        |
| 2. <i>T.</i> ( <i>Ziziphinus</i> ) <i>stirophorus</i> , <i>W.</i> | 12. <i>T.</i> (—) <i>infundibulum</i> , <i>W.</i>                   |
| 3. <i>T.</i> (—) <i>tiara</i> , <i>W.</i>                         | 13. <i>T.</i> (—) <i>pachychiles</i> , <i>W.</i>                    |
| 4. <i>T.</i> (—) <i>transenna</i> , <i>W.</i>                     | 14. <i>T.</i> (—) <i>azorensis</i> , <i>W.</i>                      |
| 5. <i>T.</i> ( <i>Margarita</i> ) <i>brychius</i> , <i>W.</i>     | 15. <i>T.</i> (—) <i>dnopherus</i> , <i>W.</i>                      |
| 6. <i>T.</i> (—) <i>charopus</i> , <i>W.</i>                      | 16. <i>T.</i> (—?) <i>scintillans</i> , <i>W.</i>                   |
| 7. <i>T.</i> (—) <i>pompholugotus</i> , <i>W.</i>                 | 1. <i>Turbo</i> ( <i>Calcar</i> ) <i>henicus</i> , <i>W.</i>        |
| 8. <i>T.</i> (—) <i>lima</i> , <i>W.</i>                          | 2. <i>T.</i> <i>transenna</i> , <i>W.</i>                           |
| 9. <i>T.</i> (—) <i>æglées</i> , <i>W.</i>                        | 3. <i>T.</i> ( <i>Collonia</i> ) <i>indutus</i> , <i>W.</i>         |

7. *BASILISSA OXYTROPIS*, *W.*

St. 344. April 3, 1876. Ascension Island. 420 fms. Hard ground. 2 young specimens.

*Shell*.—Small, high, conical, scalar, with a sharp, expressed carina at the periphery and a second carina above, angulating the whorls.

*Sculpture*. There are a few close-set slight spirals on the edge of the flat base; there are many not close-set, flexuous, longitudinal ribs above the periphery, but on the base merely lines of growth. These ribs in crossing the upper carina form small sharp-pointed tubercles, of which there is also a trace on the lower carina. The superior *sinus* lies just above the upper carina, the basal sinus toward the middle of the base: both are well marked. The *apex* is small and flat, the smooth embryonic  $1\frac{1}{4}$  whorl hardly rising at all. The *whorls* are of slow increase. The *pillar* is perpendicular, with a strong rounded sinus which corresponds to a swelling within the umbilicus. The *umbilicus* is not large, but deep, funnel-shaped, with a puckered sharp edge. In both specimens there are  $5\frac{1}{2}$  whorls to a height of 0.05 and a breadth of 0.055.

This species slightly resembles *B. alta*, *W.*, var. *oxytoma*, *W.*, but is more depressed, the carina is sharper and is double, and the longitudinal ribs are very much stronger. Than *B. costulata*, *W.*, this species is smaller, higher, more conical, and it is scalar; the whorls are more carinated above, and the peripheral carina is much more projecting; the apex is minuter and sharper, though the embryonic whorl is less raised, the base is smooth but for the marginal spirals; the umbilicus is smaller.

Before leaving this genus I may add that A. Adams's subgenus of *Forskällia* (*Gibbula*) is quite distinct. In it "the last whorl has a conspicuous *groove* at the periphery" according to his definition; but that is a spiral furrow formed by an impressed fold of the shell-wall in each successive whorl—not a sinus in the edge

of the mouth resembling that in the *Pleurotomidæ*, and differing from that of *Sequenzia* in the same way as the sinus of *Defrancia* differs from that of a typical *Pleurotoma*.

I may further say that I have lately, through the kindness of Dr. Gwyn Jeffreys, had an opportunity of examining a specimen of the *Solarium reticulatum*, Phil. (see 'Enumeratio,' II. 149, XXV. 6), a subfossil species from Calabria. It is quite certainly a *Basilissa*, and is intermediate between *B. costulata*, W., and *B. oxytropis*, W. From the former it differs in being much flatter on the base, sharper at the edge of the umbilicus and at the carina, and much more delicately sculptured. Than *B. oxytropis* it has a less expressed carina, and the whorls are not angulated in the middle.

1. TROCHUS (GIBBULA) GLYPTUS, W. (*γλυπτός*, carved.)

St. 164 A (2). June 13, 1874. Lat.  $34^{\circ} 13' S.$ , long.  $151^{\circ} 38' E.$  Sydney. 410 fms. Grey ooze. 1 specimen.

*Shell*.—Like *T. magus*, L., but carinated, higher, less scalar, and much more delicately and richly sculptured. *Sculpture*. Spirals—a flat shoulder below the suture is followed by an angulation, on and below which is a double row of smallish, round, but pointed tubercles, which are remote from one another but run in pairs on the two rows. The tubercles in each row are connected by a slight rounded thread. On the second, third, and fourth whorls these rows coalesce into one; on the last whorl they are about 0.05 inch apart. At the periphery is a strong angulation bearing a sharp carina. About 0.05 inch above this is a spiral thread which, as well as the carina, is ornamented with delicate, sharp, laterally-compressed beads separated from one another by about twice their own size. Those on the upper spiral are rather the larger; the middle of the whorl for about 0.1 inch is bare. On the base there are five closely-beaded threads, of which the inmost and strongest defines the umbilicus. Between the outermost and the carina is a broad slightly sunken furrow. The carina meets the outer lip and appears above the suture. Longitudinals—the upper whorls are ribbed, but the ribbing gradually breaks into the double row of paired tubercles, and the link uniting the pairs in the two rows becomes very feeble. There are besides many distant, irregular, loose-skin-like puckerings which follow the lines of growth; they disappear on the spiral threads. The whole surface is further roughened by microscopic flexuous wrinklings. *Colour* yellowish white on the

thin calcareous layer overlying the nacre. *Spire* high, a little scalar. *Apex* small and sharp. *Whorls* 8, of regular increase, a little rounded, angulated at the carina, rather tumid on the base, with a wide umbilicus. *Suture* angulated and well defined, but a little filled up by the carina of the overlying whorl. *Mouth* (apparently) perpendicular, semioval. *Outer lip* well rounded. *Pillar-lip* a little bent over on the umbilicus, and then advancing rather straight towards the left, angulated and slightly toothed at the point of the base where the umbilical beaded thread joins it. *Umbilicus* a wide deep funnel with a deep spiral staircase at the junction of the whorls. H. 0·68. B. 0·72, least 0·61. Penultimate whorl 0·19. Mouth, height 0·32, breadth 0·32.

This beautiful species is unfortunately present in only one dead and chipped specimen. It is more like *T. magus*, L., than any other species I know, but is obviously very different in all details of form and sculpture. The name given to it is expressive of the singular beauty of its sculpture.

2. TROCHUS (ZIZIPHINUS) STIROPHORUS, *W.* (στειροφόρος, keeled.)

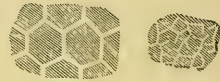
St. 24. Mar. 25, 1873. Culebra, St. Thomas, Danish West Indies. 390 fms. Mud. 1 specimen.

*Shell*.—Small, conical, scalar, inflated on the base; whorls angulated, with three strong carinas near the periphery, white over nacre. *Sculpture*. Spirals—at the periphery is a sharp flange-like carina; above this, about one third of the distance to the suture, is a second, almost equally strong and prominent, which forms a shoulder to the whorls. The space between this and the suture is divided pretty equally by two threads, the lower of which is feeble. On the upper whorls all of these are closely beaded, on the last whorl only the two highest are so. Below the carina is another remote strong thread, which meets the outer lip; within it is another, not quite so strong nor so distant, and occupying the space from this to the middle are five flat close-set threads, followed by three rather more separated and roughly beaded threads, the inmost of which, like a twisted cable, forms a sort of pillar with a chink between it and the sharp edge of the pillar-lip, and advances into a small tooth at the angle where it joins the outer lip on the base. Longitudinals—the whole surface is roughened by rather coarse oblique lines of growth, which on the upper whorls appear as oblique reticulating ribs. *Colour* white, with a translucent calcareous layer over nacre. *Spire* rather high, scalar. *Apex* a little flattened down and rounded, the



minute rounded embryonic  $1\frac{1}{4}$  whorl scarcely rising above the level. *Whorls* 6, of rather rapid increase, with a narrow flat shelf below the suture, thence sloping flatly to the shoulder-carina, from which point the contour-line descends perpendicularly; the base is inflated at the edge and flattened in the middle. *Suture* deeply impressed between the narrow flat shelf below and the overhanging carina above. *Mouth* slightly oblique, but with a perpendicular pillar, round; nacreous within. *Outer lip* thin, transparently porcellanous on the edge, but thickened by naeare within. *Pillar-lip* perpendicular, rounded within the mouth, advancing to a sharp point in front, slightly reverted but not appressed, having a small open furrow and a minute umbilical chink behind it. H. 0.3. B. 0.26, least 0.22. Penultimate whorl 0.053. Mouth, height 0.14, breadth 0.14.

This species extremely resembles *T. occidentalis*, Migh., but is smaller, is broader in proportion, with a less high spire; the apex is not sharp and projecting, but flattened down and rounded: the whorls are much more scalar, and of more rapid increase; the base is more tumid on its outer edge and more rounded. The apex is ornamented with a minute and quite irregular inlaid work of angular depressions, parted by very narrow interrupted raised lines; whereas in that species the ornamentation is like honeycomb, with relatively large, nearly regular hexagonal pits and raised flat borders. This difference is shown in the woodcut. The threads on the base are approximate, not parted in the middle by a smooth zone, and the pillar-lip is not appressed as in that species; the outer lip, too, is thickened within by the layer of naeare.



Ornamentation of apex.

*T. occidentalis.*

*T. stirophorus.*

3. TROCHUS (ZIZIPHINUS) TIARA, W. (From its high narrow form.)

St. 24. Mar. 25, 1873. Culebra, St. Thomas, Danish West Indies. 390 fms. Mud. 1 full-grown and 8 young specimens.

St. 56. May 29, 1873. Bermudas. 1075 fms. Grey ooze. 3 specimens.

*Shell*.—Small, conical, high-spined, flatly rounded on the base, sculptured, white, dull on the surface, with a bright nacreous gleam shining through. *Sculpture*. Spirals—on the upper part of the last whorl there are two rows of tubercles, the first and

weaker is close up to the suture ; the second is a little lower than the middle, and its tubercles are strong. Of these there are on each row twenty to twenty-five ; they are scarcely connected by a spiral thread. The periphery is sharply angulated and defined by an expressed and tubercled carina, the tubercles of which are hardly so strong as those of the second row above, which from its larger points projects quite as much as the carina. On the base there is an infracarinal furrow and three or four sharpish, equally parted, faintly tubercled, spiral threads, the inmost of which is most distinctly tubercled, and defines the umbilical depression. Longitudinals—the apical whorls, except the embryonic one, are crossed by high, sharp, slightly oblique ribs ; but these on the later whorls break up into tubercles, between which on the different rows there is a slight irregular connexion by flattened ridges, which are oblique, interrupted, and on the base sinuous. Besides these the surface is roughened by minute wavy irregular lines of growth. *Colour* white, with a translucent layer of porcellanous glaze over brilliant pearly nacre. *Spire* high. *Apex* small, flattened, with the minute inflated  $1\frac{1}{4}$  embryonic whorl rising a little exerted on one side. *Whorls* 7, projecting out squarely below the suture, flattened in the middle, protuberant at the second row of tubercles, and slightly contracted above the carina ; at the carina sharply angulated. The base, which is flatly rounded, has a narrow flattish margin, and in the middle a slight umbilical depression, in the centre of which is a minute umbilical hole almost covered by the pillar-lip. *Suture* linear. *Mouth* scarcely oblique, and very slightly inclined out from the axial line, squarish, but rounded on the base and at the angles, a little broader than high, nacreous within. *Outer lip* not thin, with a slight callus just within it ; it is slightly sinuated on the base at the outer corner. *Pillar-lip*, on leaving the body, bends over very flatly so as to cover the umbilicus, after which it curves round to the left ; it has a very blunt tubercle in the middle, is a little reverted, and has a very slight furrow behind it. *Umbilicus* a small open depression leading into a minute central pore. The slopes of the depression are obliquely scored by the tubercles of the central basal thread. H. 0·22. B. 0·16, least 0·15. Penultimate whorl 0·05. Mouth, height 0·06, breadth 0·07.

This beautiful little shell offers some rather perplexing features ; for the curves of growth on the base indicate a slight sinus toward its outer edge, which, indeed, is shown in the actual mouth-

edge, a peculiarity suggestive of the genus *Basilissa*; but there is not seldom in the Trochidæ a tendency to a backward curve of the lip-edge at that point; and in this species there does not exist the characteristic infrasutural sinus which would connect it with *Basilissa* or with *Sequenzia*, to which its tubercled pillar and closed umbilicus rather point.

*Margarita carinata*, A. Ad., from the Philippines, has some points of resemblance with this, but is obviously very different—markedly in the form of the umbilicus.

4. TROCHIUS (ZIZIPHINUS) TRANSENNA, *W.* (A lattice.)

St. 201. October 26, 1874. Lat.  $7^{\circ} 3' N.$ , long.  $121^{\circ} 55' E.$  Philippines. 102 fms. Stones and gravel. 1 specimen.

*Shell*.—Small, conical, high, carinated, inflated on the base, thin, sculptured, yellowish with small ruddy spots. *Sculpture*. Spirals—close to the suture is a row of disconnected beads; between this and the carina are three rows of appressed beads, of which the highest is the weakest; these four rows are parted from one another by furrows, each of which is a little broader than the thread above it; the carina also consists of a row of appressed beads; it is stronger than the other threads both in breadth and height, and the furrow above it is a little broader and deeper than the rest. On the base are seven rows of appressed beads of nearly equal width and distance from one another: the first joins the outer lip, the central row twines up the pillar. These rows of beads make their appearance on the second whorl, and, on all the upper whorls, more than on the body-whorl, the carina is sharply expressed by a constriction above and below it. Longitudinals—the whole surface is crossed obliquely by not quite contiguous threads, which are almost as strong as the spirals. Between the threads are narrow, deep, long pits; each alternate thread is crowned by a bead at the suture. *Colour*. The surface is dull and rough, yellowish, sparsely spotted on the spirals with a ruddy brown, which is almost crimson on the infrasutural beads. *Spire* high and conical, the whorls being barely rounded. *Apex* small but flattened, the embryonic  $1\frac{1}{4}$  whorl scarcely projecting. *Whorls* 7, of regular increase, almost flat, the body-whorl alone being slightly convex, rounded, and carinated at the periphery and tumid on the base, in the centre of which is the most minute umbilical chink. *Suture* deeply and squarely impressed below the carina. *Mouth* slightly

oblique, squarish, nacreous. *Outer lip* very thin, very slightly descending and drawn in a little horizontally at its junction with the body, and then well rounded in its whole sweep to the point of the pillar-lip, near which it is externally crenulated by the ends of the basal threads. *Pillar* is short, straight, slightly tubercled on its inner side, hardly toothed in front, and still less angulated at its junction with the outer lip. The pillar-lip is very thin, slightly excavated longitudinally, and reverted on the minute umbilicus, which it almost wholly conceals. Behind it is a very narrow furrow. H. 0·27. B. 0·22, least 0·2. Penultimate whorl 0·075. Mouth, breadth 0·117, height 0·125.

In form and details of sculpture this species is extremely like *T. (Thalotia) elisa*, Gould, from island of Capul, in the Philippines (B.M.), but is very obviously different.

5. TROCHUS (MARGARITA) BRYCHIUS, *W.* (*βρύχιος*.)

St. 152. February 11, 1874. Lat. 60° 52' S., long. 80° 20' E. 1300 miles S.E. of Kerguelen. 1260 fms. Diatomaceous ooze. 2 specimens.

*Shell*.—Globosely depressed, with a small high spire, very thin, rather opaque, rough, dull, and slightly iridescent. *Sculpture*. The whole surface looks as if a rough epidermis were gathered into close, minute, obliquely longitudinal puckerings, with stronger folds about 0·003 in. broad and 0·005 in. apart. These folds tend on the last whorl to disappear, except near the suture and toward the umbilicus. They are crossed by fourteen to sixteen fine round spiral threads, which at the crossing of each fold rise into knots. On the upper surface of the body-whorl they become very faint; there are four on the penultimate whorl, the first being remote from the upper suture, the last close to the lower suture. Besides these the surface is microscopically wrinkled spirally. *Colour* a dead slightly greyish white, which, toward the mouth, especially when wet, is faintly shot with a green and pink iridescence. *Spire* rather high, the earlier whorls being small and very much twisted out so as to rise above one another by almost their entire height. The *apex* is round and blunt, and terminates abruptly, but all the earlier whorls are stripped of their outer layer. *Whorls* 5, very round, of very regular but rather rapid increase. *Suture* deeply and sharply impressed. *Mouth* rather oblique, round, not descending, brilliantly iridescent within. *Outer lip* thin, turning down to meet the pillar-lip, and



carried across the short junction with the body by a thin nacreous callus, which is continued within and is, in fact, the completion of the whorl into a tube. *Inner lip* slightly thickened, curved, just barely reflected. *Umbilicus* wide and pervious, exposing all the whorls, and strongly cross-hatched within by the spiral and longitudinal threads. *Operculum* very thin, clear, and bright, with about eight faintly defined turns and marked with microscopic concentric lines. H. 0·64. B. 0·87, least 0·62. Penultimate whorl 0·18. Mouth, height 0·43, breadth 0·4.

This shell slightly recalls *Helix ericetorum*, Müll., but much more closely resembles some of the West-Indian land-operculates, such as *Aulopoma*. There is a *Margarita umbilicalis*, Broderip, which it is like, so far as one can judge from Chenu's figure. With its continuous peristome it very much recalls a *Cyclostrema*, all the more so that it is less pearly within, less nacreous and more chalky, and less globosely conoidal than *Margaritas* usually are.

6. TROCHUS (MARGARITA) CHAROPUS, W. (*χαροπὸς*, light blue.)

St. 149 (9). Jan. 29, 1874. Lat. 49° 16' S., long. 70° 12' E. Kerguelen Islands, W. Christmas Harbour. 105 fms. 5 specimens.

*Shell*.—Globosely conical, like a *Cyclophorus*, thin, translucent, umbilicated, iridescent, banded, spirally studded with irregular interrupted, long, narrow, sharp tubercles. *Sculpture*. Of spiral threads there are from twenty-five to thirty-five, sharply projecting, rounded, and fine on the last whorl; of these, from three to seven are feebler than the rest; those on the base are continued within the mouth. The interstices are much broader than the threads. The whole surface is also fretted by microscopic spirals and stronger longitudinals which follow the oblique lines of growth. Of the threads, six to thirteen appear on the penultimate whorl; they begin with the second whorl, and there the longitudinals are rather disproportionately strong and regular. The embryonic apex is faintly but coarsely tubercled. *Colour* yellowish white, shot on the upperside with a dark iridescence; the spirals are black, clouded, and broken with oblique longitudinal streaks of white. The *spire* is high and turreted. The apex, porcellanous and scarcely iridescent, is small, high and mammillate, and consists of the one embryonic whorl, which is a little turned up on its side. *Whorls* 6, of gradual and regular increase, rounded, near the apex a little angulated by one of the spirals. *Suture* well marked, angulated,

but not sharply so. *Mouth* rather oblique, round, hardly angulated at the upper corner, not in the least descending, brilliantly iridescent within and showing the coloured spirals of the outside. *Outer lip* thin, slightly puckered at the spirals, a little thickened on the base. *Inner lip* thickened and reflected, especially at its junction with the body, where it almost covers the umbilicus. The *pillar* is much curved, and thins gradually out to its junction with the base. The *umbilicus* is large and funnel-shaped on the base, deep, but small further in, contracted by a spiral white pillar-pad, and more than half covered over by the pillar-lip. *Operculum* rather thin, horny, yellow, with ten to twelve very gradual turns, which are strongly defined by a thickened line; it is feebly marked with concentric and with radiating lines. H. 0·77. B. 0·78, least 0·66. Penultimate whorl 0·2. Mouth, height 0·4, breadth 0·4.

There is a *M. striata*, Leach (nec Brod.), which this resembles, but is very much more flattened and broader, and much more contracted in the spire.

Var. CÆRULEUS, W.

St. 151. Feb. 7, 1874. Heard Island. 75 fms. Mud. 1 specimen.

This differs from the type in having only four spiral threads above the periphery, while on the base below the peripheral thread the threads are also fewer, and are flattened out till they are barely parted by narrow lines of iridescent white. With the exception of these and the white umbilicus, the base is of an intense blue-black grey. The comparative absence of the spirals on the upper part of the whorls gives a flatness to the aspect of the shell below the suture, while the strength of the second and fourth spirals gives an angulation to the whorls that is apt to mislead the eye, the more so that the only specimen of this variety has the whole spire completely covered with Polyzoa. In spite, however, of its deceptive appearance, I am persuaded that this is only a variety of *T. charopus*, the more so that the markings on the embryonic whorl are identical.

In form this variety especially recalls *Margarita polaris*, Beck (Geneva Mus., Coll. Delessert), as also in its distant rather sharp spirals and half-covered umbilicus, but is more depressed on the base and flattened below the suture; the whorls are of much

more rapid increase, the spirals on the base are very much more numerous, and the shell is brilliant in polish and in colour.

7. *TROCHUS* (*MARGARITA*) *POMPHOLUGOTUS*, *W.* (*πομφολυγωτὸς*, bubble-shaped.)

St. 24. March 25, 1873. North of Culebra Island, St. Thomas, Danish West Indies. 390 fms. *Globigerina*-ooze, coral, shells. 1 specimen.

*Shell*.—Depressedly globose, with a low turreted spire, thin, opaque, chalky, rough, umbilicate. *Sculpture*. There are of spirals on the last whorl about forty, low, rounded, very unequal, some being very minute, one or two above the periphery stronger than the rest; the lowest of all is much the strongest, and defines the umbilicus, within which the whole sculpture increases in distinctness; on the penultimate whorl there are about twelve spirals fully stronger than on the last. The furrows are broader than the threads, but as they widen are occupied by a minute intermediate thread. Longitudinally these spirals and furrows are crossed by much finer and sharper oblique threads, which in general are much narrower than their interstices; but towards the mouth, where all the sculpture becomes feebler, these threads become extremely numerous and crowded. *Colour* yellowish chalky white over brilliant nacre. *Spire* not much elevated, but a little scalar. *Apex* eroded. *Whorls* 5, rounded, of rapid increase, inflated on the base. *Suture* impressed near the apex, while towards the mouth it becomes filled up, and is finally margined, by the last whorl lapping up rather coarsely on the previous one. *Mouth* rather oblique, a little higher than it is broad, slightly flattened above, and a very little angulated at the junction of the outer lip to the body. *Lip* thin, a very little reflected on the umbilicus, porcellanous on the edge, with a very slight pearly marginal callus, which is continuous across the body, and nacreous within. *Umbilicus* large, funnel-shaped, quickly contracting, but leaving the whole inner spire visible. H. 0·38. B. 0·4, least 0·33. Penultimate whorl 0·1. Mouth, height 0·23, breadth 0·2.

Both in form and texture this species is extraordinarily like a depressed *Cyclostoma*. I have given it its name, in the absence of marked features, from its slight resemblance to a bubble. It has some resemblance to *T. lima*, *W.*, when, as sometimes in that species, the sculpture is exceptionally obsolete; but the

sculpture is still very obviously different, and the form is globose, not, as in that species, high and conical.

8. TROCHUS (MARGARITA) LIMA, W.

St. 73. June 30, 1873. Lat. 38° 30' N., long. 31° 14' W. W. of Azores. 1000 fms. *Globigerina*-ooze. 5 specimens (1 full-grown).

St. 75. July 2, 1873. Lat. 38° 37' N., long. 28° 30' W. Fayal, Azores. 450 fms. Sand. 4 specimens, in spirit.

St. 78. July 10, 1873. Lat. 37° 24' N., long. 25° 13' W. St. Miguel, Azores. 1000 fms. *Globigerina*-ooze. 7 specimens (3 full-grown).

*Shell*.—Conical, with a broad and tumid base and a wide narrowed umbilicus; surface cross-hatched like a file; when fresh, translucent with a pearly sheen. *Sculpture*. Spirals—three to five slightly raised remotely beaded threads, of which one lies a little below the suture, one at the periphery forming a carina, of which the beads are much smaller and closer set, sometimes evanescent; one, with beads like the first, defines the umbilicus, within which there is a strong spiral ridge; and the whole surface is covered with fine rather sharp threads, whose partings are twice as broad as themselves. Of these finer spirals the one which meets the outer lip often rises into prominence and defines the base, while another above the carina sometimes stands out more strongly and more beaded than the rest. Longitudinals—the whole surface is close-set with these, which are crossed by the spirals, than which they are broader but less sharp, closer-set, and more irregular and interrupted, especially near the upper line of tubercles and near the umbilicus. *Colour* a bluish white when alive, with a translucent calcareous layer through which the nacre shines. *Spire* high, a little scalar. *Apex* small, a little flattened, with the embryonic  $1\frac{1}{4}$  whorl barely projecting in the middle. *Whorls* 6–7; the last is of rapid increase, full rounded and a little tumid; the preceding ones are a little roundedly shouldered below the suture, flat on the contour, angulated at the carina, and slightly contracted into the suture; the apical whorls are simply rounded and longitudinally ribbed. *Suture* is linear, but strongly, not acutely defined by the perpendicular rise of the whorl above it and the slight sloping shoulder below. *Mouth* round, scarcely oblique, with a translucent porcellanous edge, and pearly within. *Outer lip* not descending, sharp, its inner edge is bevelled outwards at the expense of the



pearly layer. *Pillar-lip* bends over the umbilicus, is a little reverted, and expands into a tooth at the intra-umbilical ridge. *Umbilicus* funnel-shaped, wide, pervious, but narrowed within by the spiral ridge. *Operculum* of very many narrow whorls, which on their outer edge overlap as a narrow gleaming flange. H. 0·32. B. 0·32, least 0·28. Penultimate whorl 0·09. Mouth, height 0·18, breadth 0·18.

This is a much larger species than *T. (M.) cinereus*, Couth., from the North Atlantic, much higher, much more conical, much more exquisitely sculptured, suture more impressed, base more tumid and not angulated at the edge, umbilicus larger.

Than *T. (M.) amabilis*, Jeffr., it is, of course, still larger, less conical, less angulated, the sutural impression is not like a rounded gouged-out line as it is there, the base is not flattened, and the whole style of sculpture is totally distinct.

The measurements given above are taken from an almost exceptionally fine specimen from St. 78.

9. TROCHUS (MARGARITA) ÆGLEËS, *W.* (*ἀγλήεις*, beautiful.)

St. 24. Mar. 25, 1873. Culebra Island, St. Thomas, Danish West Indies. 390 fms. Mud. 5 grown and many young specimens.

*Shell*.—Broadly conical, high, with a very large umbilicus, ornamented with rows of tubercles, carinated. *Sculpture*. Spirals—there is a row of small round pointed tubercles a little below the suture. The carina is double, formed by two rather remote tubercled threads, the lower of which runs to the outer lip. Below this one is a broadish furrow and slightly beaded thread, which, towards the mouth, projects so as to become a third carina. The centre of the base has another slightly beaded thread; and another, formed of remote rounded tubercles, defines the umbilicus, within which is a very slight furrow and an ill-defined ridge. Longitudinals—the apical whorls are ribbed, but the ribs gradually break into the scarcely connected tubercles of the last whorl. The lines of growth are hardly perceptible, except on the base. *Colour* pure white when weathered, but apparently slightly brownish when fresh, with a pearly nacre below the thin calcareous surface-layer. *Spire* high, very slightly scalar. *Apex* sharp, minute, flattened on the one side, with the very small embryonic  $1\frac{1}{4}$  whorl rising sharply on the other. *Whorls* 7, of regular increase; the last is small, from the large

part of it cut out by the umbilicus; they are flattened on the contour and slightly scalar. *Suture* linear, but strongly defined by the right-angled junction of the whorls. *Mouth* oblique, much inclined to the axial line, rectangularly rounded, the pillar and outer lip being parallel. *Outer lip* thin and broken, not descending. *Pillar-lip* shortly but flatly bent over the umbilicus, and here it is patulous and sinuated, it then advances in a straight line towards the base. It is toothed in the middle by a strongish spiral protuberance, at which point it projects; but from this to the junction with the base it is thin and retreats. *Umbilicus* very large, funnel-shaped, and pervious. H. 0·27. B. 0·3, least 0·25. Penultimate whorl 0·08. Mouth, height 0·1, breadth 0·15.

This very beautiful species is well defined by its exactly conical form and very large umbilicus, which cuts the whole body out of the inside of the last whorl, narrowing the base to an extraordinary extent. The young shells are excessively like those of *Trochus (Ziziphinus) tiara*, W., but are flatter, broader, and more umbilicated.

10. TROCHUS (MARGARITA) CLAVATUS, W. (*clavus*, a nail.)

St. 24. Mar. 25, 1873. Culebra Island, St. Thomas, Danish West Indies. 390 fms. Mud. 8 specimens (none full-grown?).

St. 120. Sept. 9, 1873. Lat. 8° 37' S., long. 34° 28' W. Pernambuco. 675 fms. Mud. 2 young specimens (?).

*Shell*.—Small, conical, with a high spire and a tumid base, a round mouth, and a deep umbilicus, and covered with sharp prickles. *Sculpture*. Spirals—there are several small threads, two of which, of equal strength and prominence, angulate the whorls—one at the basal contraction, the other about halfway up the whorl; on the base they are somewhat closer set. The outer lip does not meet the carinal thread, but the one below. Longitudinals—the whole surface is crossed by close-set, slightly oblique narrow laminæ, which, in crossing the spirals, rise into sharp vaulted prickles whose faces are turned towards the mouth. *Colour* white, with a pearly lustre. *Spire* very high. *Apex* minute, with the small embryonic  $1\frac{1}{4}$  whorl rising from a minute flat. *Whorls*  $6\frac{1}{4}$ , angulated and narrow in the spire, but the last inflated and expanded. *Suture* deeply impressed, somewhat depressed, and very strongly defined. *Mouth* perpendicular, round, slightly pointed on the base, and angulated at the upper carina. *Outer lip* sharp, advancing far across the body towards the pillar-

lip. *Pillar-lip* depressed upon the umbilicus, then rounded and sinuated, slightly toothed at the point of the pillar. *Umbilicus* wide and deep, but internally narrowed. II. 0·17. B. 0·13, least 0·1. Penultimate whorl 0·03. Mouth, height 0·07, breadth 0·07.

The peculiarly high narrow spire and the vaulted prickles are very characteristic features of this species. When full-grown there would probably be an additional whorl, which would add a broad base to the high narrow spire. There seems to be some variation in the number of the spirals. I have put a query to the specimens from Pernambuco, because, though identical in other respects, the embryonic whorls are slightly larger and more tumid. The curves of the mouth-edge have some suspicion of an infrasutural sinus, and the form of the pillar is also suggestive of *Basilissa*, but the form of the mouth is wholly unlike that genus.

11. TROCHUS (MARGARITA) RHYSUS, *W.* (ῥυσός, wrinkled.)

St. II. Jan. 13, 1873. Lat. 38° 10' N., long. 9° 14' W. Setubal. 470 fms. *Globigerina*-ooze. 1 specimen (young).

St. 23. Mar. 15, 1873. Sombrero Island, St. Thomas, Danish West Indies. 450 fms. *Globigerina*-ooze. 1 specimen.

*Shell*.—Small, conical, scalar, with rounded base and large umbilicus, sculptured. *Sculpture*. Spirals—there is a double, tubercled carina, of which the basal one meets the outer lip; the upper and stronger angulates the whorl about two fifths from the base; less than one fifth from the suture is a shoulder formed by a row of stronger remoter tubercles scarcely connected by a thread. On the base are two feebly beaded threads; another strongly beaded defines the umbilicus, close within which lies another delicately and remotely beaded. Longitudinals—the top whorls are strongly ribbed, but further down these ribs break into tubercles and become disconnected; but traces of these longitudinals remain here and there. The lines of growth are very faint. *Colour* white, with a pearly lustre. *Spire* high, scalar. *Apex* not fine, rounded, with the inflated  $1\frac{1}{4}$  embryonic whorl standing out prominently. *Whorls* 6, flat below the suture, angulated at the first spiral, flat on the contour, angulated at the second spiral, and contracted into the suture below. *Suture* acutely angulately impressed. *Mouth* round, angulated at the front of the pillar. *Pillar-lip* slowly and slightly bent over the umbilicus.

*Umbilicus* open, funnel-shaped, internally scored with minute longitudinal ribs. H. 0·25. B. 0·21, least 0·18. Penultimate whorl 0·05. Mouth, height 0·1, breadth 0·09.

The specimen from which I have described this is in bad condition; but the species is certainly distinct from any other known to me.

12. TROCHUS (MARGARITA) INFUNDIBULUM, *W.*

St. 56. May 29, 1873. Bermudas. 1075 fms. Grey ooze. 2 specimens, not full-grown.

St. 146. Dec. 29, 1873. Lat. 46° 46' S., long. 45° 31' E. Marion Island. 1375 fms. Bot. temp. 1°·5 C. *Globigerina*-ooze. 5 specimens (3 with the animal in spirit).

*Animal* of a uniform light colour. *Foot* broad, bluntly pointed behind. *Appendages* 5, probably 6, large, between which the membrane above them is edged with many small ones.

*Shell*.—Conical, with a tumid base, carinated, umbilicated, thin, translucent, pearly. *Sculpture*. Spirals, on the upper whorls 2, on the body-whorl 7–8, pretty strong, but fine beaded threads. The first lies remote below the suture, and is sparsely ornamented by longitudinally produced, high and pointed, tubercles; it forms a shoulder on the whorl. The second projects strongly and sharply at the periphery and forms the carina; it and those below are delicately fretted with close-set small beads. The third, which meets the outer lip, lies within the contraction of the base. The last two are closer than the rest, which, however, are sometimes brought closer by the additional thread which appears among them. The one which defines the umbilicus is more sharply beaded than the rest. Longitudinals—below the suture and near the umbilicus the surface is sharply but delicately puckered, and these puckerings, strong in the early whorls, are in the later faintly continued across the whorls as lines of growth. *Colour* yellowish white, with a brilliant nacreous sheen shining through the thin superficial calcareous layer, which becomes more opaque in drying. *Spire* high, scalar. *Apex* minute, flattened, with the minute bulbous embryonic  $1\frac{1}{4}$  whorl projecting on one side. *Whorls* 8, of rapid increase, rounded, but angulated by the projection of the spirals, very tumid on the base. *Suture* linear, but strongly defined by the contraction of the supra-adjacent whorl and the flat shoulder of the one below. *Mouth* very slightly oblique, round, but on the pillar flattened, and at the



point of it angulated slightly; nacreous within; across the body there is no pad, but the shell is eroded, which looks like a thin callus. *Outer lip* thin, not descending. *Pillar-lip* slightly patulous, bending flatly over the umbilicus, and then advancing in a straight line to the point of the pillar, where it is slightly angulated just where the beaded umbilical spiral ends. *Umbilicus* funnel-shaped, rather open, but a good deal contracted within, sharply scored with the lines of growth. *Operculum* yellow, horny, very thin, of 7 to 8 whorls. H. 0·81. B. 0·65, least 0·59. Penultimate whorl 0·2. Mouth, height 0·37, breadth 0·35.

This beautiful species, of very singular aspect, recalls in a very general way the form of *Turcica monilifera*, A. Ad., but differs from that in its rounded contours, strongly contracted suture, umbilicus, and straight untoothed pillar. There is a *Margarita aspecta*, A. Ad., which this species resembles in form, but that is less tumid, is carinated, its umbilicus is much smaller, the spirals are many more, and they are not tubercled.

The presence of this species at two such separate localities as Bermudas and Marion Island, between the Cape and Australia, is interesting.

13. TROCHUS (MARGARITA) PACHYCHILES, W. (παχύχειλης, thick-lipped.)

St. 201. Oct. 26, 1874. Lat. 7° 3' N., long. 121° 48' E. Philippines. 102 fms. Stones and gravel. 1 specimen.

*Shell*.—Small, conical, with the last whorl tumid, especially toward the mouth, which is extremely oblique, with a thickened lip; carinate, widely umbilicate. *Sculpture*. Spirals—in the centre of the body-whorl is a strong carinal thread, which almost runs into the outer lip at its junction with the body, but just lies above it, and so stands out round the base of the whole earlier whorls; this thread is set with strong, sharp, remote tubercles, which become feebler and more crowded toward the mouth: halfway between the carina and the suture is another thread, set with feebler tubercles; these two threads only appear on the second regular whorl, but on the body-whorl, especially towards the mouth, many others make their appearance a little below the carina, and issuing from the junction of the outer lip is a feebler tubercled thread, defining the base. On the base are three strong closely-beaded threads, the inmost of which defines the umbilicus, within which is a finer beaded thread and, deep inside, a ridge.

Longitudinals—all the upper whorls are crossed by strong straight ribs, forming tubercles where they cross the spirals, and leaving deep square hollows between. Only on the penultimate whorl do these become oblique and feebler, till toward the mouth they are narrow, weak, crowded and broken. Besides these, the whole surface is roughened with small, coarse, irregular lines of growth. *Colour* dead white. *Spire* high and conical, but the tumidity of the last whorl, especially towards the mouth, greatly detracts from this; it is slightly scalar. *Apex* small. *Whorls* 6, of slow increase till the last, angular, projecting out squarely from the suture, flattened on the contour, and contracted below the carina; but the last whorl is rounded, tumid, and, toward the mouth, expanded. The base is rounded, but not inflated. *Suture* very deep and strong, from the overhanging of the carina above it. *Mouth* extremely oblique, perfectly round but for a slight flatness across the body and an angulation at the junction of outer lip and of the pillar-lip to the body; pearly within. *Outer lip* very slightly descending on its line of junction to the body-whorl, then in its sweep rising a little: it is scarcely angulated at the lower carina and at the point of the pillar, but it is a little sinuated at that part; it is thin on the edge, but is thickened within by a pretty strong pearly callus and outside by a slight rounded marginal varix. *Pillar-lip* is hollowed back into the pillar in a sinus, and is sharply reverted, so as to leave a minute but deep furrow behind it; this reversion ceases just before it reaches the umbilical thread, and forms a minute tooth at that point. *Umbilicus* wide and pervious, but narrowed within; its slope is scored with minute sharp curved laminae, the remnants of the old edges of the pillar-lip sinus. H. 0·18. B. 0·27, least 0·17. Penultimate whorl 0·04. Mouth, height 0·1, breadth 0·1.

In general aspect this is very like *T. (Margarita) gemmulosa*, A. Ad., in the British Museum; but that species has the spire lower, the suture distinctly depressed, the sutural furrow is beset with close radiating striae, the spiral threads are more numerous and crowded, the pointed tubercles on these are more frequent, and there is no varix on the outer lip. That last is a feature which gives a great peculiarity to this species; but the thickening and the patulousness of the lip are not sufficient to connect it with *Gaza*. The distinct umbilicus and the absence of a tooth narrowing the mouth separate it obviously from *Craspedotus*.

14. TROCHUS (MARGARITA) AZORENSIS, *W.*

St. 75. July 2, 1873. Lat. 38° 37' N., long. 28° 30' W. Fayal, Azores. 450 fms. Sand. 1 specimen in spirit.

*Animal*.—Dark in colour. *Operculum* rather strong, dark horn-colour, of very many narrow whorls, which on the outside are flanged with a thin narrow over lying border.

*Shell*.—Small, strong, but not thick, conoidal, high, with rounded contours, slightly angulated, scalar, sculptured, whitish, with a slightly flattened base and a small umbilicus. *Sculpture*. Spirals—there are very many close, unequal, irregular small furrows, which are feebler on the base and strongest near the suture, which is marginated below by a narrow smooth line round the top of the whorls. In the centre of the base is an umbilical depression with spiral threads in the bottom, and within this a strong white porcellanous spiral cord, which almost closes the umbilicus. Longitudinals—the top of the whorls is gathered into broad rounded oblique puckers, which die out before reaching the suture or the base. Besides these, the whole surface, spiral furrows and all, is sharply scratched with very close and numerous lines of growth. *Colour* yellowish translucent white, with a dull all-pervading nacreous gleam. The strong cord which fills the umbilicus is white, as is also the apex. *Spire* high, scalar, the separate whorls being a good deal sunk into one another, as well as flattened below the suture. *Apex* small, rounded, the minute embryonic  $1\frac{1}{4}$  whorl barely projecting. *Whorls* 6, of regular increase, slightly flattened below the suture, rounded on the contour, barely contracted round their base; the last is faintly angulated at the periphery, and not much rounded on the base. *Suture* strongly marked by the contraction of the whorl above and the margination below. *Mouth* oblique, round. *Outer lip* sharp but strong, porcellanous on the edge, brilliantly nacreous within; it descends very slightly. *Pillar-lip* thick, white, bent, nearly to the point of the pillar, over the umbilicus. It would be reverted but for the great thickness of the spiral pad, which comes twining up behind it out of the umbilicus, and out of which, at the point of the pillar, it forms a flat, triangular, tooth-like expansion. *Umbilicus* a minute spiral hole, which twists in between the overlying pillar-lip and the umbilical pad; the edge is corrugated with the old lines of the lip. H. 0.33.

B. 0·4, least 0·3. Penultimate whorl 0·1. Mouth, height 0·2, breadth 0·17.

This species somewhat resembles in form *T. tumidus*, Mont.; but, apart from differences of texture, colour, and sculpture, it is much less angulated and less broad on the base than that, and the upper whorls are more tumid and more immersed. *T. (M.) grænelandicus*, Ch., it also resembles in form and size; but, apart from all differences of colour and sculpture, it is, than that, less conical, more scalar, the suture is much more impressed, and the whorls are more immersed. From *T. (M.) lima*, W., it differs in the whorls being much more tumid and the general form less conical. From *T. (M.) pompholugotus*, W., it differs in the last whorl being far less tumid and out of proportion with those which precede. In contrast with *T. (M.) dnopherus*, W., the pad on the pillar-lip is here rather on the outside, with the lip flattened out upon it, while in that species the thickening is on the inside, filling up the lip.

15. TROCHUS (MARGARITA) DNOPHERUS, W. (*δνοφερὸς*, dusky.)

St. 122. Sept. 10, 1873. Lat.  $9^{\circ} 5'$  to  $9^{\circ} 10'$  S., long.  $34^{\circ} 49'$  to  $34^{\circ} 53'$  W. Off Pernambuco. 350 fms. Mud.

*Shell*.—Depressedly conical, rather strong, semitransparent, of a dark pearly iridescence. *Sculpture*. There are spiral ridges, strong, five above the base; the first is close to the suture and is exquisitely beaded from the middle of the second whorl; the beads are about thirty-five on the last, twenty-two on the penultimate whorl. The second ridge is remote from the first, and forms a shoulder to the whorls. The third, fourth, and fifth occupy the periphery, which is carinated by the fourth till close up to the mouth, when the fifth forms the carina. Four fine threads, of which the first is partially beaded, lie in the flat between the first and second ridge; two between the second and third; one between the third and fourth. Below the fifth ridge is a flat furrow narrower than the rest; below the furrow is a sixth ridge, slighter than the others; and then the base is closely covered with eleven spiral threads, which tend to become stronger and wider apart near the umbilicus. The first three ridges alone appear on the upper whorls. Longitudinally the whole surface is sharply scored by the lines of growth. *Colour* a ruddy brownish white, shot with a purple and green iridescence. *Spire* depressedly



scalar. *Apex* bluntly mammillated by the somewhat shapeless, round, largish, glassy, ruddy, embryonic whorl. *Whorls*  $4\frac{1}{2}$ , of rather rapid increase. *Suture* rather faint. *Mouth* oblique, roundish, being slightly peaked above and a little angulated on the pillar. *Outer lip* sharp but not thin, brilliantly iridescent within. *Inner lip* very much thickened by a pearly pad, which is very thick below where it envelopes what might otherwise have been a tooth on the point of the pillar. The pad is thinner in the middle of the pillar, and thickens again at the junction with the body-whorl, where it thins out quickly. The lip here is very slightly reflected on the umbilicus. *Umbilicus* very small and contracted, not so much by the reflection of the inner lip as by the pillar being bent round to the right across it. *Operculum* very thin, yellow, horny, with about eleven very faintly defined turns. H. 0·28 in. B. 0·37, least 0·26. Penultimate whorl 0·08. Mouth, height 0·2, breadth 0·2.

This species has a close general resemblance to *Margarita obscura*, Couth., but that is smaller, of slower increase, has an open umbilicus, is very dull in colour, and the whole minute system of spirals is different and much fewer; the tubercled spiral in particular is the second, not the first as here, and is not close to the suture. Than *M. poculosa*, Gould, which it resembles in its style of spirals, this is more discoidal, especially is this more tabulated below the suture than that; the angulation here is on the upper, not on the lower part of the whorls, and in that the infrasutural thread is not beaded.

#### 16. TROCHUS (MARGARITA?) SCINTILLANS, W.

St. 24. Mar. 25, 1873. Culebra Island, St. Thomas, Danish West Indies. 390 fms. Mud. 5 young specimens.

St. 56. May 29, 1873. Bermudas. 1075 fms. *Globigerina*-ooze. 1 specimen.

*Shell*.—Small, thin, white, very depressedly conoidal, angulated, tumid on the base, umbilicated; mouth semioval. *Sculpture*. It is perfectly smooth but for some curved puckerings which radiate from the umbilicus but very soon die out; above the middle the body-whorl is roundly angulated. *Colour* pure white, with a transparent calcareous layer over brilliant fiery pearly nacre. *Spire* very flatly conical. *Apex* bluntly rounded, with a minute, hyaline, depressed embryonic tip. *Whorls*  $4\frac{1}{2}$ , barely rounded. *Suture* slightly depressed. *Mouth* semioval. *Outer lip* thin,

barely angulated at the periphery. *Pillar-lip* straight, patulous, right-angled at its junction with the base. *Umbilicus* small. H. 0·14. B. 0·2, least 0·16. Penultimate whorl 0·025. Mouth, height 0·09, breadth 0·11.

The specimen from which I have described this is neither full-grown nor perfect, but the species is a very well-marked one. It is much more depressed and has the whorls less rounded than *T. (M.) nitens*, Jeffr. Than *T. helycinus*, Fabr., it is much more depressed, much more brilliantly nacreous, and the surface is much more polished, and the radiating puckers are much stronger.

I have put a query to *Margarita* as the group to which this should be attached, because it has not a rounded mouth; but there is no other group of *Trochus* to which it can so well be attached, and none of the characters by which *Margarita* is defined are very constant.

1. TURBO (CALCAR) HENICUS, W. (ένικòς, unique.)

St. 173. July 24, 1874. Lat. 19° 10' S., long. 179° 40' E. Matuka, Fiji. 315 fms. 3 specimens.

*Shell*.—Conical, high; whorls flattened, sculptured, with a spine nose carina, below which the suture is deeply channelled, scarcely coloured. *Sculpture*. Spirals—below the suture is a flat shoulder, the edge of which is angulated and bordered by a row of largish, white separate beads; on the flat slope of the last whorl are six rows of smaller separate beads, the highest row being the largest; they are not connected by a thread, and the intervals between the rows are about half the breadth of the beads. At the periphery is a sharp, expressed, stellate carina, the sharp, hollow, compressed spines of which are about twelve in number. Below the carina the whorls are somewhat constricted, and the contour-line here is perpendicular; on it are four rows of fine beads. The edge of the base is sharply angled and defined by a second smaller, sharp, expressed carina which meets the outer lip; it rises in from thirty to thirty-five vaulted scales, which toward the mouth become like spines. On the flat base are ten very regular rows of separate beads, which are a little stronger toward the middle, and the outermost one of which tends to become scaly. The centre is occupied by a polished, slightly ridged, porcellanous pad. Longitudinals—below the suture and between the beads there are many irregular puckerings following the lines of growth. *Colour* a light yellowish ruddy tinge, the base paler than the

upper part; the beads are white, and the porcellanous pad round the pillar is dead white, with more of translucency towards the centre; the pillar has a slight ruddy tinge. *Spire* high, perfectly conical. *Apex* round, the minute embryonic whorl being completely flattened down. The first three whorls are only radiatingly ribbed. On the fourth the highest row of beads begins, on the fifth the supracarinal row appears, and only on the sixth does the intermediate space become covered, previous to which the whorls have a nacreous gleam. *Whorls* 7 to 8, of very regular increase, flattened and angulated. *Suture* itself linear, marginated by the up-lap of the inferior whorl which covers the basal carina; it is very strongly channelled by the square contraction of the superior whorl beneath the stellate carina. *Mouth* oblique, round, angulated at the basal carina, with an exquisite soft pearly nacre within. *Outer lip* sharp, thin, with a broad porcellanous edge, and within this a broad flat nacreous callus; it is flat on the base. *Pillar-lip*, a broadly expanded porcellanous pad rises in the middle of the base, coils round the pillar, with a slightly swollen outer edge, and advances in front into a blunt round tooth. The edge of the lip is a broad, round, slightly ruddy pillar of nacre which unites itself with the labial callus. *Operculum* oval, rounded on the outer and straightish on the pillar contour, thick, with steep straight edges, and a very slight flange on its outer lower margin; its outer surface white, tubercled, rounded; its inner surface is flat, brown, lineated, with one large and very many minute whorls. H. 0·82. B. 1·0, least 0·81. Penultimate whorl 0·22. Mouth, height 0·36, breadth 0·39.

Perhaps *Turbo Philippiana*, A. Ad., or *T. (Guildfordia) rhodostoma*, Lam. (Geneva Museum), most closely resembles this species, which is, however, very distinct and much more beautiful. Strictly speaking, it belongs to none of the *Calcar* or *Astralium* groups, but touches several of these. The operculum is unlike that of *Stella*, of *Uvanilla*, or *Pomaulax*. The form of the shell is unlike *Pachypoma*, and neither shell nor operculum suit *Lithopoma*, *Imperator*, *Tubicanthus*, &c.

## 2. TURBO TRANSENNA, *W.* (*transenna*, a grating.)

St. 235. June 4, 1875. Lat. 34° 7' N., long 138° 0' W. Japan. 565 fms. Mud. 1 specimen.

*Animal*.—A pale uniform colour: the eyes are large and black, on short processes. There are no frontal lappets between the

tentacles, and though the forehead is thickened there and transversely wrinkled, there is no veil. The usual fringed membrane extends backwards above the foot-edge to the front of the operculum, but bears no threads.

*Shell*.—Low, conical, round, with expanded base, sculptured, solid. *Sculpture*. The whole shell is cross-hatched by narrow, impressed, intersecting lines, which cross the whorls obliquely and not quite regularly nor uniformly, and which cut the surface into little diamonds resembling shagreen. *Colour* dirty rusty white. *Spire* rather low, but conical. *Whorls* of very rapid increase, apparently about 6. *Suture* linear, scarcely impressed. *Mouth* very oblique, round, nacreous to the very edge. *Outer lip* very slightly patulous, sharp on the edge, with a thick nacreous layer beveled off to the edge above and in front, but on the base turned over and advancing in a rounded pad beyond the lip. *Pillar-lip* consists of a rounded mass of nacre, backed and above obscured by a considerable porcellanous deposit, which is widely but thinly spread out over the body so as to connect in a continuous sweep the outer and the pillar lips. It is distinctly impressed with the scale-like pattern of the underlying sculpture. Its edge is abrupt and chipped. *Operculum* thin, flat, highly porcellanous, with a translucent and slightly thinner central area on the outside. On the inside yellow, with many whorls, the nucleus nearly central, the suture well marked, and the last whorl less disproportionately large than usual. H. 0·87. B. 1·04, least 0·79. Penultimate whorl 0·29. Mouth, height 0·75, breadth 0·65.

The sculpture of this species is very peculiar. In form the shell is not unlike a *Diloma*, or something between *Litorina saxatilis* and a *Natica*. In texture the shell is thinner than the thickened lip suggests. The measurements of the mouth are not satisfactory, the outer edge of the pillar-lip being indefinite; if they be taken within the opening, they would give it as more truly round. The apex is eroded; and the whole aspect of the shell is so weathered that but for the presence of the animal I should have taken it for an old and spoiled specimen.

### 3. TURBO (COLLONIA) INDUTUS, W.

St. 24. Mar. 25, 1873. Culebra Island, St. Thomas, Danish West Indies. 390 fms. 4 specimens.

*Shell*.—Small, conoidal, high, whorls tumid, base flattened;



colour white, glossy. *Sculpture*. The whole substance of the shell is faintly marked with remote spiral threads, and the surface is very faintly scratched with closer microscopic striæ. The whorls are bluntly angulated in the middle, and the last is so besides at the base below the periphery; this angulation meets the outer lip. The second and third whorls have two or three strong spiral threads. Longitudinals—there are very many, close, unequal, very oblique, hair-like lines of growth, of which the strongest rise in close-set, infrasutural puckerings, which on the third whorl resemble small beads. *Colour*. There is a glossy, thin, ivory-white calcareous coat over a brilliant pearly white layer. *Epidermis*. On the one living specimen there is an excessively thin tenacious brown layer, which may possibly be only an accidental deposit. *Spire* high, fine-pointed. *Apex* blunt, the smooth round embryonic  $1\frac{1}{4}$  whorl scarcely projecting. *Whorls* 6, of rapid increase, tumid, the penultimate especially rising swollen out of the suture, the base is a little flattened. *Suture* linear, not impressed, a little coarse, slightly margined by the up-lap of the succeeding on the preceding whorl and the slight tumidity caused by the infrasutural puckerings. *Mouth* very oblique, round, with a soft pearly nacre all round. *Outer lip* very slightly descending, thick, bevelled outwards to a sharp edge. *Pillar-lip*. There is a broad, thin, hyaline pad spread over the body and connecting the outer lip and the pillar, which is broad, thick, shallowly excavated, with a slight external median horizontal tooth or ridge; the edge is reverted and closely appressed. *Operculum* small, thin, calcareous, flat, convex on the inside, where it shows  $7\frac{1}{2}$  whorls; the last whorl close to its end begins suddenly to enlarge. *Teeth* distinctively those of the family as represented by Lovén (see *Trochus* or *Phasianella*), there being endless rows of innumerable minute crooked uncini, with several (probably eleven) hooked and serrated central rasps, but in their confused dried-up condition it was impossible more minutely to identify them. H. 0·27. B. 0·25, least 0·23. Penultimate whorl 0·09. Mouth, height 0·13, breadth 0·12.

There is in the B.M. a species marked "*Collonia marginata*, Lam.," which in colour and form more than any other resembles this; but that is lirated, is rounded on the base, is toothed on the outer lip, and has not the angulation in the middle of the whorls.

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